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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,597	10/27/2003	Osamu Sekiguchi	27391/US589	3511

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EXAMINER

LEADER, WILLIAM T

ART UNIT PAPER NUMBER

1742

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/694,597

Applicant(s)

SEKIGUCHI ET AL.

Examiner

William T. Leader

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 26, 2006, has been entered.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Mooij et al (5,861,091) or Japanese patent publication 52-7828 in view of Bard et al (*Electrochemical Methods*), Cook (4,517,064) and Brodsky et al (6,190,530), and further in view of the admitted prior art.
4. As indicated in the previous office action, Mooij et al teach a method for dissolving zinc comprising bringing a source of zinc ions (the anode) and a zinc dissolution accelerating metal (the cathode) into electrical contact with each other, thus creating a galvanic cell (figure 14; column 4, line 58 - column 5, line 33).

5. The Japanese patent document also discloses that zinc ions may be supplied to an electrolyte by electrical contact with a metal which is less noble than zinc which causes the zinc to dissolve. See the English language abstract.

6. Claim 1 differs from Mooij et al and the Japanese patent publication by reciting shaking, vibrating or rotating in order to accelerate zinc dissolution from the source of zinc ions. As previously indicated Bard et al teach that the rate of an electrochemical reaction is dependent on mass transfer variables such as convection, i.e., stirring (figure 1.3.2, page 17). Cooke teaches that vibrating the anode substantially eliminates polarization voltage and thus provides an electrolytic cell of lower operating voltage (column 2, lines 37-41). Brodsky et al teaches that a vibrating mechanism improves plating efficiency by providing a more uniform container loading or packing (column 5, lines 16-18).

7. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to modify the method Mooij et al by shaking, vibrating or rotating the electrodes to stir the electrolyte as taught by Bard et al, Cooke and Brodsky et al because Bard teaches that stirring can affect the rate of an electrode reaction (the dissolution of zinc), Cooke teaches vibration eliminates polarization voltage and Brodsky et al teach that vibrating improves plating efficiency. Furthermore, it would have been obvious to have used a galvanic cell such as that of Mooij et al as a source of zinc ions for a plating bath, because the admitted prior art shows that galvanic cells have been used as sources of zinc for plating baths (background section, paragraph 5).

8. Regarding claims 4 and 7, Mooij et al teach that the source of zinc ions (anode) is pure zinc and that the zinc dissolution accelerating metal (cathode) is iron, which is more electropositive than zinc. As noted above, the Japanese patent document discloses dissolving zinc and providing a counter electrode (cathode) which is less noble (more electropositive) than zinc. The counter electrode may be iron, cobalt, nickel, copper, silver, gold or platinum.

9. Regarding claims 5 and 6, Mooij et al and the Japanese patent document do not teach that the degree of contact of either than anode or cathode with the electrolyte is controlled in response to the zinc ion concentration. As indicated in the previous office action, Bard et al teach that the rate of electrochemical reaction is affected by the surface area of the electrode (figure 1.3.2, page 17). Changing the degree of contact between the electrodes and the electrolyte would change the effective surface area of the electrode because a larger or smaller portion of the electrode's surface would be exposed to the electrolyte. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Mooij et al by controlling the degree of contact between the electrodes and the electrolyte, in order to control the rate of zinc dissolution as taught by Bard et al, and thereby adjust the zinc ion concentration.

10. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mooij et al (5,861,091) or Japanese patent publication 52-7828 in view of Bard et al (*Electrochemical Methods*), Cook (4,517,064) and Brodsky et al (6,190,530), and further in view of the admitted prior art as applied to claims 1 and 3-7 above, and further in view of Holland (1,511,967).

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11. Claim 2 recites that the anode and cathode are placed in the same vessel and brought into direct contact with each other. As indicated in the previous office action, Holland teaches that galvanic cells can be set up so that the anode and cathode are in direct contact with each other (column 1, lines 33-44). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Mooij et al or the Japanese patent document by placing the anode and cathode in the same vessel and bringing them into direct contact as disclosed by Holland because Holland teaches that the galvanic current will flow whether the metals are in direct contact or connected by a wire (column 1, lines 40-44).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 571-272-1245. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
William Leader  
September 14, 2006

  
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SUPERVISORY PATENT EXAMINER  
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